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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,656	02/07/2002	Eric M. Prophet	269/132	3328

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O'MELVENY & MYERS LLP
114 PACIFICA SUITE 100
IRVINE, CA 92618

EXAMINER

LOKE, STEVEN HO YIN

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,656

Applicant(s)

PROPHET, ERIC M.

Examiner

Steven Loke

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7-15,21 and 23-26 is/are rejected.
- 7) ☒ Claim(s) 2-6,16-20 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5 6) ☐ Other: _____

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1. Applicant's election with traverse of claims 1-12 in Paper No. 8 is acknowledged.

The traversal is on the ground(s) that independent claims 1 and 13 are generic to the embodiments shown in Figs. 1 and 2. This is found persuasive and the examiner withdrawn the species restriction as set forth in paper no. 7.

2. The disclosure is objected to because of the following informalities:

It is believed that fig. 3D discloses a top view of a passivation layer patterned into a hexagonal mesh instead of a square mesh (page 4, line 12).

It is also believed that fig. 3E discloses a top view of a passivation layer patterned into a square mesh instead of a hexagonal mesh (page 4, line 13).

There is no reference numeral [10] (page 5, line 2) in fig. 1.

Appropriate correction is required.

3. Claims 1-26 are objected to because of the following informalities: Line 1 of each of claims 1-26, the word "MEMS" should be in full written form. The word should re-write as "Micro-Electro-Mechanical System". Claim 17, line 1, the phrase "the microstructure" has no antecedent basis. Claim 22, line 1, the phrase "the micro-structure" has no antecedent basis. Appropriate correction is required.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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5. Claims 1, 7, 8, 11-15, 21, 25 and 26 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Silverbrook.

In regards to claim 1, Silverbrook shows all the elements of the claimed invention in figs. 1-3 and 17. It is a Micro-Electro-Mechanical System (MEMS) apparatus, comprising: a substrate [11]; a passivation layer [13 or 22] on the substrate [11], the passivation layer having a top surface; and a microstructure (the nozzle plate [41]) suspended above the substrate [11], the microstructure having a bottom surface facing the top surface of the passivation layer [13 or 22], wherein the passivation layer [13 or 22] is patterned so that the top surface of the passivation layer is substantially different from the bottom surface of the microstructure [41].

In regards to claim 7, Silverbrook further discloses the passivation layer [13 or 22] is patterned to form a mesh.

In regards to claim 8, Silverbrook further discloses the bottom surface of the microstructure [41] is substantially flat (see fig. 17).

In regards to claim 11, Silverbrook further discloses the passivation layer [22] comprises polyimide (polytetrafluoroethylene (PTFE)) (col. 6, lines 20-21).

In regards to claim 12, Silverbrook further discloses the passivation layer [13] comprises silicon nitride (col. 6, line 13 and figs. 4 and 7).

In regards to claim 13, Silverbrook shows all the elements of the claimed invention in figs. 1-3 and 17. It is a Micro-Electro-Mechanical System (MEMS) apparatus, comprising: a substrate [11]; a passivation layer [13 or 22] on the substrate [11], the passivation layer having a top surface; a support having side walls [40] (the support on

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the left side of fig. 3) attached to the substrate [11] via the layers [12, 13]; a beam (a portion of the nozzle plate [41] extends from the support on the left side of fig. 3 to the support on the right side of fig. 3) attached at one end to the support and suspended above the substrate, the beam having a bottom surface facing the top surface of the passivation layer; wherein the passivation layer [13 or 22] is patterned so that the top surface of the passivation layer [13 or 22] is substantially different from the bottom surface of the beam.

In regards to claim 14, Silverbrook further discloses a second support (the support on the right side of fig. 3) attached to the substrate via the layers [12, 13] and wherein the beam is attached to the second support at a second end.

In regards to claim 15, Silverbrook further discloses a bottom electrode (conductor [53] of fig. 15) on the substrate [11] and underneath the bottom surface of the beam.

In regards to claim 21, Silverbrook further discloses the passivation layer [13 or 22] is patterned to form a mesh.

In regards to claim 25, Silverbrook further discloses the passivation layer [22] comprises polyimide (polytetrafluoroethylene (PTFE)) (col. 6, lines 20-21).

In regards to claim 26, Silverbrook further discloses the passivation layer [13] comprises silicon nitride (col. 6, line 13 and figs. 4 and 7).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 9, 10, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook.

In regards to claims 9 and 23, Silverbrook differs from the claimed invention by not showing the mesh is a square mesh. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a square mesh because it depends on the amount of ink release from the inkjet nozzle.

In regards to claims 10 and 24, Silverbrook differs from the claimed invention by not showing the mesh is a hexagonal mesh. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a hexagonal mesh because it depends on the amount of ink release from the inkjet nozzle.

8. Claims 2-6 and 16-20 would be allowable if rewritten to overcome the objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The major difference in the claims not found in the prior art of record is the passivation layer is patterned to form a plurality of spaced protuberances. The patterned passivation layer would reduce the potential contact area between the beam and the substrate when the beam is pulled down, thereby reducing adhesive forces between the beam and the substrate and the likelihood of stiction in a MEMS structure.

10. The applicant should provide a copy of each of the non-patent literature documents cited in the IDS filed on 2/7/02.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (703) 308-4920. The examiner can normally be reached on 7:50 am to 5:20 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

sl
May 4, 2003

Steven Loke
Primary Examiner

A handwritten signature in black ink that reads "Steven Loke". The signature is written in a cursive style with a large, stylized "S" and "L".